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10/676,957	09/30/2003	Carl Myerholtz	10020421-1	8137

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EXAMINER
CROW, ROBERT THOMAS

ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 02/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/676,957	MYERHOLTZ ET AL.	
	Examiner	Art Unit	
	Robert T. Crow	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *19-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I in the reply filed on 29 November 2003 is acknowledged. Claims 19-31 are withdrawn. Claims 1-18 are currently under prosecution.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 7-14, and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsue et al (U.S. Patent No. 5,866,321, issued 2 February 1999).

Regarding claim 1, Matsue et al teach a device comprising a first electrode, and pad of resistive material disposed adjacent the first electrode (e.g., a layer of carbon ink [column 9, lines 61-63] of gold [column 10, line 23]), a second electrode disposed adjacent the pad, and a probe supported on the pad (column 9, line 55-column 10, line 25 and Figures 1A and 1B).

Regarding claim 2, Matsue et al teach the device of claim 1, wherein at least some of the probe is supported on at least one of the first electrode and the second electrode (column 9, line 67-column 10, line 2, and Figures 1A and 1B).

Regarding claim 3, Matsue et al teach the device of claim 1, wherein the first electrode, the second electrode, and the pad are supported on the substrate (e.g., the device of Figures 1 and 2 is a combined device; column 14, lines 19-20).

Regarding claim 4, Matsue et al teach the device of claim 3, wherein a gap is defined between the pad and at least one of the first electrode and the second electrode (column 24, lines 27-29 and Figures 1A and 1B).

Regarding claim 7, Matsue et al teach the device of claim 2, wherein the substrate comprises a non-conductive layer (column 15, lines 63-67), said non-conductive layer supporting the first electrode, the second electrode, and the pad (e.g., the device of Figures 1 and 2 is a combined device; column 14, lines 19-20).

Regarding claim 8, Matsue et al teach the device according to claim 1, wherein the pad of resistive material is carbon thin film (e.g., a layer of carbon ink, column 9, lines 61-63).

Regarding claim 9, Matsue et al teach the device of claim 1, wherein the probe comprises nucleic acids (column 14, lines 63-67).

Regarding claim 10, Matsue et al teach a microarray comprising a plurality of devices according to claim 1 supported on a substrate in an array format (e.g., a plurality of analytical areas; column 3, line 66-column 4, line 2).

Regarding claim 11, Matsue et al teach the microarray of claim 10, wherein each of the plurality of devices comprises a different probe (column 6, lines 25-37).

Regarding claim 12, Matsue et al teach the microarray of claim 10, wherein the microarray comprises at least one reference device (i.e., reference electrodes; column 11, line 34).

Regarding claim 13, Matsue et al teach the microarray of claim 10, wherein at least a plurality of the first electrodes of the plurality of devices are in electrical communication with a common bus disposed on or in the substrate (e.g., the electrodes are connected to a detector [column 10, lines 19-20], wherein the detector and the analyzer are combined [column 14, lines 19-20]).

Regarding claim 14, Matsue et al teach the microarray of claim 10, wherein each of the plurality of devices has a gap defined between the pad of said device and at least one of the first electrode and the second electrode of said device (Figures 1A and 1B).

Regarding claim 17, Matsue et al teach the microarray of claim 10, wherein the substrate comprises a non-conductive layer supporting the plurality of devices (column 15, lines 63-67).

Regarding claim 18, Matsue et al teach the microarray of claim 10, wherein the probe of each of the plurality of devices comprises nucleic acids (column 14, lines 63-67).

2. Claims 1-5, 7-13, 15, and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Eggers et al (U.S. Patent No. 5,532,128, issued 2 July 1996).

Regarding claim 1, Eggers et al teach a device comprising a first electrode, a pad of resistive material disposed adjacent the first electrode (Figures 2a and 2b, wherein the resistive layer is a metal linker layer; column 8, lines 28-32), a second electrode disposed adjacent the pad, and a probe supported on the pad (column 4, lines 52-60 Figures 2a and 2b).

Regarding claim 2, Eggers et al teach the device of claim 1, wherein the probe is supported on at least one of the first electrode and the second electrode (column 4, lines 45-46 and Figure 2a).

Regarding claim 3, Eggers et al teach the device of claim 1, wherein the first electrode, the second electrode and the pad are supported on a substrate (Figures 2a and 2b).

Regarding claim 4, Eggers et al teach the device of claim 3, wherein a gap is defined between the pad and at least one of the first electrode and the second electrode (Figure 2a).

Regarding claim 5, Eggers et al teach the device of claim 3, wherein the first electrode and the second electrode physically contact the pad (Figure 2b, wherein the resistive layer is a metal linker layer; column 8, lines 28-32).

Regarding claim 7, Eggers et al teach the device of claim 1, wherein the substrate comprises a non-conductive layer (e.g., glass; column 8, line 5), said non-conductive layer supporting the electrodes and the pad (column 3, line 67).

Regarding claim 8, Eggers et al teach the device of claim 1, wherein the pad of resistive material is a metal thin film (e.g., a metal linker layer; column 8, lines 28-32).

Regarding claim 9, Eggers et al teach the device of claim 1 wherein the probe comprises polypeptides (column 7, lines 61-66).

Regarding claim 10, Eggers et al teach a microarray comprising a plurality of devices according to claim 1 supported on a substrate in an array format (Abstract, lines 1-2).

Regarding claim 11, Eggers et al teach the microarray of claim 10, wherein each of the plurality of devices comprises a different probe (column 4, lines 9-11).

Regarding claim 12, Eggers et al teach the microarray of claim 10, wherein the microarray comprises at least one reference device (e.g., circuitry for comparing the test frequency to a know frequency for a site with unbound probes; column 14, lines 60-63).

Regarding claim 13, Eggers et al teach the microarray of claim 10, wherein at least a plurality of the first electrodes of the plurality of devices are in electrical communication with a common bus disposed on or in the substrate (e.g., the device is a single integrated circuit; column 3, lines 63-67).

Regarding claim 15, Eggers et al teach the microarray of claim 10, wherein the first electrode and the second electro of each of the plurality of devices physically

contact the pad of the respective device (Figure 2b, wherein the resistive layer is a metal linker layer; column 8, lines 28-32).

Regarding claim 17, Eggers et al teach the microarray of claim 10, wherein the substrate comprises a non-conductive layer (e.g., glass; column 8, line 5) supporting the plurality of devices (column 3, line 67).

Regarding claim 18, Eggers et al teach the microarray of claim 10 wherein the probe of each of the plurality of devices comprises polypeptides (column 7, lines 61-66).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsue et al (U.S. Patent No. 5,866,321, issued 2 February 1999) in view of Kittlesen et al (J. Am. Chem. Soc., vol. 106, pp. 7389-7396 (1984)).

Regarding claim 6, Matsue et al teach a device comprising a first electrode (column 9, lines 60-63), and pad of resistive material disposed adjacent the first electrode (e.g., gold; column 10, line 23), a second electrode disposed adjacent the pad, and a probe supported on the pad (column 9, line 55-column 10, line 25 and Figures 1A

and 1B; e.g., claim 1). Matsue et al further teach the device, wherein the first electrode, the second electrode, and the pad are supported on the substrate (e.g., the device of Figures 1 and 2 is a combined device [column 14, lines 19-20]; e.g., claim 3). Matsue et al do not specifically teach fissures within gold layer.

However, Kittlesen et al teach the microfabricated arrays (page 7389, column 1, paragraph 1, lines 1-2) comprising gold pads subdivided into segments (Figure 3) with the added benefit that the segments are individually functionalized in a controlled manner (page 7390, column 1, paragraph 1, lines 5-6) to create diode devices (page 7390, column 1, paragraph 1, line 13-column 2, line 1).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have combined the device as taught by Matsue et al with the segmented gold resistive pads as taught by Kittlesen et al. The combination of the device as taught by Matsue et al with the segmented gold resistive pads as taught by Kittlesen et al would have been motivated by the expected benefit that the segments are individually functionalized in a controlled manner (Kittlesen et al, page 7390, column 1, paragraph 1, lines 5-6) to create diode devices (Kittlesen et al, page 7390, column 1, paragraph 1, line 13-column 2, line 1).

Regarding claim 16, Matsue et al teach the device of claim 1 as discussed above under claim 6. Matsue et al further teach a microarray comprising a plurality of devices according to claim 1 supported on a substrate in an array format (e.g., a plurality of

analytical areas [column 3, line 66-column 4, line 2]; e.g., claim 10). Matsue et al do not specifically teach fissures within gold layer.

However, Kittlesen et al teach the microfabricated arrays (page 7389, column 1, paragraph 1, lines 1-2) comprising gold pads subdivided into segments (Figure 3) with the added benefit that the segments are individually functionalized in a controlled manner (page 7390, column 1, paragraph 1, lines 5-6) to create diode devices (page 7390, column 1, paragraph 1, line 13-column 2, line 1).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have combined the device as taught by Matsue et al with the segmented gold resistive pads as taught by Kittlesen et al. The combination of the device as taught by Matsue et al with the segmented gold resistive pads as taught by Kittlesen et al would have been motivated by the expected benefit that the segments are individually functionalized in a controlled manner (Kittlesen et al, page 7390, column 1, paragraph 1, lines 5-6) to create diode devices (Kittlesen et al, page 7390, column 1, paragraph 1, line 13-column 2, line 1).

2. Claims 6 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eggers et al (U.S. Patent No. 5,532,128, issued 2 July 1996) in view of Kittlesen et al (J. Am. Chem. Soc., vol. 106, pp. 7389-7396 (1984)).

Regarding claim 6, Eggers et al teach a device comprising a first electrode, a pad of resistive material disposed adjacent the first electrode (Figures 2a and 2b, wherein the

resistive layer is a metal linker layer; column 8, lines 28-32), a second electrode disposed adjacent the pad, and a probe supported on the pad (column 4, lines 52-60 Figures 2a and 2b; e.g., claim 1). Eggers et al further teach device, wherein the first electrode, the second electrode and the pad are supported on a substrate (Figures 2a and 2b; e.g., claim 3). Eggers et al do not specifically teach fissures within the resistive metal linker layer.

However, Kittlesen et al teach the microfabricated arrays (page 7389, column 1, paragraph 1, lines 1-2) comprising gold pads subdivided into segments (Figure 3) with the added benefit that the segments are individually functionalized in a controlled manner (page 7390, column 1, paragraph 1, lines 5-6) to create diode devices (page 7390, column 1, paragraph 1, line 13-column 2, line 1).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have combined the device as taught by Eggers et al with the segmented gold resistive pads as taught by Kittlesen et al. The combination of the device as taught by Eggers et al with the segmented gold resistive pads as taught by Kittlesen et al would have been motivated by the expected benefit that the segments are individually functionalized in a controlled manner (Kittlesen et al, page 7390, column 1, paragraph 1, lines 5-6) to create diode devices (Kittlesen et al, page 7390, column 1, paragraph 1, line 13-column 2, line 1).

Regarding claim 16, Eggers et al teach the device of claim 1 as discussed above under claim 6. Eggers et al further teach a microarray comprising a plurality of devices

according to claim 1 supported on a substrate in an array format (Abstract, lines 1-2). Eggers et al do not specifically teach fissures within the resistive metal linker layer.

However, Kittlesen et al teach the microfabricated arrays (page 7389, column 1, paragraph 1, lines 1-2) comprising gold pads subdivided into segments (Figure 3) with the added benefit that the segments are individually functionalized in a controlled manner (page 7390, column 1, paragraph 1, lines 5-6) to create diode devices (page 7390, column 1, paragraph 1, line 13-column 2, line 1).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have combined the device as taught by Eggers et al with the segmented gold resistive pads as taught by Kittlesen et al. The combination of the device as taught by Eggers et al with the segmented gold resistive pads as taught by Kittlesen et al would have been motivated by the expected benefit that the segments are individually functionalized in a controlled manner (Kittlesen et al, page 7390, column 1, paragraph 1, lines 5-6) to create diode devices (Kittlesen et al, page 7390, column 1, paragraph 1, line 13-column 2, line 1).

3. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsue et al (U.S. Patent No. 5,866,321, issued 2 February 1999) in view of Eggers et al (U.S. Patent No. 5,532,128, issued 2 July 1996).

Regarding claim 5, Matsue et al teach a device comprising a first electrode (column 9, lines 61-63), and pad of resistive material disposed adjacent the first

electrode (e.g., gold; column 10, line 23), a second electrode disposed adjacent the pad, and a probe supported on the pad (column 9, line 55-column 10, line 25 and Figures 1A and 1B; e.g., claim 1). Matsue et al further teach the device, wherein the first electrode, the second electrode, and the pad are supported on the substrate (e.g., the device of Figures 1 and 2 is a combined device [column 14, lines 19-20]; e.g., claim 3).

Matsue et al do not teach both electrodes contacting the resistive gold pad.

However, Eggers et al teach the microarray of claim 1 (as discussed above), wherein the first electrode and the second electrode physically contact the pad (Figure 2b, wherein the resistive layer is a metal linker layer; column 8, lines 28-32), with the added benefit that the material (e.g., the metal linker layer) in the well acts as a dielectric between the electrodes (column 4, lines 57-60).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have combined the device as taught by Matsue et al with the device as taught by Eggers et al. The combination of the device as taught by Matsue et al with the device as taught by Eggers et al would have been motivated by the expected benefit that the material (e.g., the metal linker layer as taught by Eggers et al) in the well acts as a dielectric between the electrodes (Eggers et al, column 4, lines 57-60).

Regarding claim 15, Matsue et al teach a microarray comprising a plurality of devices according to claim 1 supported on a substrate in an array format (e.g., a

plurality of analytical areas [column 3, line 66-column 4, line 2]; e.g., claim 10). Matsue et al do not teach both electrodes contacting the resistive gold pad.

However, Eggers et al teach the microarray of claim 1 (as discussed above), wherein the first electrode and the second electrode physically contact the pad (Figure 2b, wherein the resistive layer is a metal linker layer; column 8, lines 28-32), with the added benefit that the material (e.g., the metal linker layer) in the well acts as a dielectric between the electrodes (column 4, lines 57-60).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have combined the device as taught by Matsue et al with the device as taught by Eggers et al. The combination of the device as taught by Matsue et al with the device as taught by Eggers et al would have been motivated by the expected benefit that the material (e.g., the metal linker layer as taught by Eggers et al) in the well acts as a dielectric between the electrodes (Eggers et al, column 4, lines 57-60).

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eggers et al (U.S. Patent No. 5,532,128, issued 2 July 1996) in view of Mansky et al (U.S. Patent No. 6,535,822 B1, issued March 18, 2003).

Regarding claim 14, Eggers et al teach a device comprising a first electrode, a pad of resistive material disposed adjacent the first electrode (Figures 2a and 2b, wherein the

resistive layer is a metal linker layer; column 8, lines 28-32), a second electrode disposed adjacent the pad, and a probe supported on the pad (column 4, lines 52-60 Figures 2a and 2b; e.g., claim 1). Eggers et al further teach a microarray comprising a plurality of devices according to claim 1 supported on a substrate in an array format (Abstract, lines 1-2; e.g., claim 10). Eggers et al do not teach a plurality of each of first and second electrodes with gaps.

However, Mansky et al teach a sensor-based array having a plurality of pads and a plurality of pairs of electrodes adjacent each pad (column 2, lines 45-55 and Figure 2A) wherein the is a gap between each pair of the electrodes and the pads (column 4, lines 40-41 and Figure 2A) with the added benefit that the gap prevent the electrodes (e.g., the contact pads) from being contaminated with the test materials (column 4, lines 42-44).

It would therefore have been obvious to a person of ordinary skill in the art at the time the invention was claimed to have fabricated the device as taught by Eggers et al with the gaps between the electrodes and the pads as taught by Mansky et al. The combination of the device as taught by Eggers et al with the gaps as taught by Mansky et al would have been motivated by the expected benefit that the gap prevent the electrodes (e.g., the contact pads) from being contaminated with the test materials (column 4, lines 42-44).

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571) 272-1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (571) 272-0745. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Robert T. Crow
Examiner
Art Unit 1634

BJ FORMAN, PH.D.
PRIMARY EXAMINER